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# Food & Nutrition Research News Briefs

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## Nutrition and Health

Age-related cataracts have now been linked to a person's vitamin status in a preliminary study. A scientist from the Brigham and Women's Hospital, Boston, teamed with ARS to evaluate the nutritional status of 78 people with cataracts and 35 without. Those with cataracts had lower plasma levels of vitamin D, carotenoids (beta carotene and its relatives), or possibly vitamin C. The cataracts were located in different areas of the lens depending on the nutrient. The findings seem consistent with lab studies showing that vitamin C may protect the eye's lens against age-related cataracts and provide the first evidence that carotenoids may do the same.

Human Nutrition Research Center on Aging at Tufts, Boston, MA

Paul F. Jacques, (617) 556-3322

Heart disease may be more prevalent in men because of the small size of cholesterol-carrying particles in their blood. Low density lipoproteins (LDL's)--the major cholesterol-carrying particles--come in a range of sizes. The small, dense particles are thought to deposit the lion's share of cholesterol in artery walls--leading to atherosclerosis--because they can cross the arterial lining more readily. Men are much more likely than women to have small, dense LDL particles, according to analysis of plasma samples from 280 participants in the Framingham Offspring Study (children of people in the classic Framingham Study). Those in the study having the small particles also had higher levels of total cholesterol and triglycerides and were generally older.

Human Nutrition Research Center on Aging at Tufts, Boston, MA

Ernst Schaefer, (617) 556-3101

Fish oil concentrates reduced vitamin E levels in mice far more than did corn oil. Mice getting diets containing 5% fish oil needed 6 to 7 times more vitamin E in their feed to maintain the same plasma levels as mice on diets containing 5% corn oil. A similar finding with rabbits was reported 46 years ago, but was forgotten as people stopped taking cod liver oil. A study is now looking for this effect in human plasma. People taking fish oil capsules should be aware of the potential for vitamin E deficiency.

Human Nutrition Research Center on Aging at Tufts, Boston, MA

Simin N. Meydani, (617) 556-3129

A simple breath test can now replace the unpleasantness of swallowing a flexible tube to detect a bacterium suspected of playing a role in causing peptic ulcers. The patient first drinks a glass of water containing urea made with a harmless form of heavy carbon. If the alleged culprit, Campylobacter pylori, is lurking in the stomach, it will quickly split the urea into ammonia and heavy carbon dioxide, which is exhaled in the breath. Tried on 26 people, the breath test was as accurate in detecting the bacterium as a tissue biopsy taken through the tube. It should help scientists understand how ulcers form as well as design better treatments. The research was supported by the Veterans Administration, National Institutes of Health, the Agricultural Research Service, and Baylor College of Medicine.

Children's Nutrition Research Center at Baylor, Houston, TX

Peter D. Klein, (713) 799-6000

Breast-fed infants are satisfied with far fewer calories than currently believed adequate for normal growth. During their first 6 months, nursing infants took in

20% fewer calories than the Recommended Dietary Allowance for energy. This suggests that the RDA, which is based on 20-year-old measurements of formula intake and overestimates of breast milk intake, needs to be revised. Today's formulas are closer in composition to mother's milk, but mother's milk is still more finely tuned to infant requirements. Children's Nutrition Research Center at Baylor, Houston, TX  
Janice E. Stuff, (713) 799-6178

A nutrition survey of nearly 700 elderly Bostonians shows that large doses of vitamin C do not reduce blood levels of other vitamins or minerals, as reports have suggested. Nearly all those surveyed got adequate vitamin C as reflected by their blood levels. And many participants, particularly the women, took 10 times the Recommended Dietary Allowance (600 milligrams) or more. The women who had high blood levels of C also had higher levels of vitamins B<sub>2</sub>, E, and folate (or folic acid), suggesting they are aware of good nutritional practices. Western Human Nutrition Research Center, San Francisco, CA  
Robert A. Jacob, (415) 556-3531

The body's ability to maintain adequate mineral levels with a high-phytate diet was borne out in a recent study. Phytate--a constituent of bran--was thought to block mineral absorption dramatically. During half of a 1-month study, 10 men consumed meals containing about four times as much phytate as the typical American diet. During the other half, the phytate was removed. As expected, the men retained more iron, zinc, copper, manganese, magnesium, and calcium when the phytate was missing. But, after an initial slump on the high-phytate diet, mineral levels improved, indicating the body compensates by absorbing more or by excreting less. Vitamin and Mineral Nutrition Lab, Beltsville Human Nutrition Research Center, Beltsville, MD  
Eugene R. Morris, (301) 344-2282

West German studies on rats suggest that traces of lead are necessary for optimum growth and that deficiency impairs the oxygen-carrying capacity of the blood by altering iron metabolism. At the request of the Environmental Protection Agency, ARS scientists repeated some of these studies and concluded that lead is not essential for growth or iron metabolism. Although lead raises the oxygen-carrying capacity of young, slightly iron-deficient rats, it acts as an external agent, like a drug, rather than as an integral part of iron metabolism. Grand Forks Human Nutrition Research Center, Grand Forks, ND  
Eric O. Uthus, (701) 795-8382

Are polyunsaturated fats better than saturated fats in suppressing the liver's ability to produce additional fat? Some scientists had speculated so. But a new study of lab rats shows that both types of fat are equal in slowing down the animal liver's routine fat production. The next step: to learn if the results are true for humans. Biochemistry Research Lab, Western Human Nutrition Research Center, San Francisco, CA  
Gary J. Nelson, (415) 556-0899

USDA's Food and Fitness Program has joined forces with the nation's life and health insurers to produce Wellness at the Worksite, a 119-page manual offering program suggestions and resources for a variety of projects to enhance health and well-being at the workplace. The suggestions are flexible enough for use by a club or community organization. The manual and program assistance is available through state and county cooperative extension offices, or contact Bonnie Tanner, Executive Director, USDA Food and Fitness Program, Room 3438-S, Washington, DC 20250.  
Telephone (202) 447-8855.

## Tomorrow's Foods and Fibers

Urban dwellers can now have garden-fresh tomatoes from window boxes or tiny pots. Planting tomatoes in 3-1/2-inch pots yields compact, space-saving plants and tomatoes that compare favorably in size and taste, if watered and fertilized frequently, to those grown in the garden. The plants are dwarfed because the limited amount of soil in the tiny pots forces the roots to become densely branched and matted. This reduces nutrient uptake, hormone content, and plant growth. In experiments with one variety--Better Bush--plants grown in 3-1/2-inch pots in one sense outyielded those grown in 11-inch pots, because nearly three times as many plants could be grown in the same space.

Plant Stress Lab, Beltsville, MD  
Donald T. Krizek, (301) 344-3143

U.S. Navy sailors are testing new cotton uniforms that are wrinkle-free as well as fire-resistant. Researchers treated denim fabrics with chemicals to achieve both qualities, and the fabrics were made into pants, chambray shirts, and khaki uniforms. Fire-resistant uniforms now issued to sailors are inconvenient because they need ironing. Firefighters and others who need fire-resistant, no-iron cotton uniforms could also benefit. Textile Finishing Chemistry Research, Southern Regional Research Center, New Orleans, LA  
Robert J. Harper, (504) 286-4567

A new way to make apricot juice may boost the use of this fruit as an ingredient in soft drinks, other beverages, and foods. The simple and inexpensive method uses enzymes and porous, ceramic filters--both already used in food processing--to extract a thin, clear apricot juice from thick, pulpy concentrate. It could increase the retail value of this fruit by an additional \$15 million. At present, apricots are either dried, frozen, canned, sold fresh, or pulverized to make apricot concentrate.

Food Processing and Conversion Lab,  
Western Regional Research Center,  
Albany, CA  
Charles C. Huxsoll, (415) 486-3433

Sweetpotato french fries haven't yet hit the market, but industry is interested in studies showing that they retain their quality and beta carotene content after 1 year of frozen storage. Sweetpotatoes are an excellent source of beta carotene, which the body converts to vitamin A. Small amounts of beta carotene would be lost during frying, but agency and North Carolina State University scientists found that it was unchanged in the fries after one year of storage at 0°F. There were no appreciable changes in flavor, texture, or appearance of the cooked fries, demonstrating that consumer acceptance of sweetpotato fries wouldn't be hampered by short shelf life.

Food Science Research, Raleigh, NC  
William M. Walter, Jr., (919) 737-2979

Strawberry fields forever? No, but a new variety, Lateglow, extends the season through June and well into July. Released by ARS and the Maryland Agricultural Experiment Station, Lateglow bears firm, sweet, juicy berries that are less susceptible to skin injury than most other varieties. Ideal for the north-eastern and central United States where root diseases pose a problem, the new berry resists red stele and verticillium wilt and withstands powdery mildew, leaf spot, and leaf scorch. Plants should be available to fruit growers this fall. Fruit Lab, Horticultural Science Institute, Beltsville, MD  
Gene J. Galletta, (301) 344-3571

New European-type hops, based on the Hallertauer mittelfrueh hop, prized for its Old World beer flavor and aroma, may be available to U.S. brewers by 1990. Over the past 20 years in Germany, the original hop has fallen victim to verticillium wilt, a fungal disease. As a result, many European hop growers were forced to switch to higher yielding, healthier varieties. Now, an ARS plant geneticist has successfully crossed a genetically modified Hallertauer mittelfrueh with other European hops. U.S. hop growers will have a choice of three to five flavorful new selections that are high-yielding and disease-resistant. Horticultural Crops Research Lab, Corvallis, OR  
Alfred Haunold, (503) 757-4424



## Food Freshness and Safety

Sulfite alternatives may come from vitamin C derivatives and other compounds that, in lab studies, stopped or slowed browning of apple slices and juice for up to 48 hours. Last July, the Food and Drug Administration banned sulfites in raw fruits and vegetables. Preliminary results from an 18-month study show that dipping apple slices in either of two classes of compounds closely related to vitamin C--ascorbic acid-2-phosphates and ascorbic acid-6-fatty acid esters--was most effective. The compounds worked particularly well when mixed with cinnamic acid or an inorganic phosphate compound. Combinations with beta-cyclodextrin were effective in apple juice. Industry is interested in working with agency scientists to develop these compounds for commercial use.

Plant Science Research, Eastern Regional Research Center, Philadelphia, PA  
Kevin B. Hicks/Gerald M. Sapers,  
(215) 233-6458/6417

The practicality of using the bacterium Bacillus subtilis to control brown rot in peaches after harvest was demonstrated in ARS pilot tests on two simulated packing-house lines and in a real packinghouse in Georgia. Results indicated that the brown rot control could be used on a commercial scale. Another "good guy" bacterium, Enterobacter cloacae, stopped the Rhizopus rot fungi for up to 5 days on 70% of the peaches tested. During a 2-month experiment, a Pseudomonas bacterium in tandem with a yeastlike organism stopped any blue and gray molds from forming in Golden Delicious apples. ARS scientists have found other organisms that, in preliminary tests, control green and blue molds of citrus. If developed commercially, these biocontrol microbes could provide safe alternatives to chemical fungicides.

Appalachian Fruit Research Station,  
Kearneysville, WV  
Charles L. Wilson/Wojciech Janisiewicz,  
(304) 725-3451/  
Southeastern Fruit and Tree Nut Research Lab, Byron, GA  
P. Lawrence Pusey, (912) 956-5656

A second year of ARS trials of integrated pest management for pecan orchards in the Southeast has proved successful, and pecan growers can now adopt techniques used in the 2-year study. Researchers compared an IPM orchard with a conventionally managed orchard during 1985 and 1986. Pests managed included insects and other arthropods, diseases and weeds. Under IPM, profits were increased \$30 to \$50 per acre, pesticide loads were decreased, environmental pollution was lowered, and the risk of pests developing resistance to chemicals was reduced. IPM trees received three fewer applications of fungicide and insecticide in 1985 and two fewer fungicide and three fewer insecticide applications in 1986 than did the conventionally managed trees. Southeastern Fruit and Nut Research Lab, Byron, GA

Jerry A. Payne, (912) 956-5656

A new test, quicker and simpler than current ones, distinguishes from harmless strains a bacterium that can cause food poisoning. Scientists use a purple dye to identify a plasmid--genetic material outside the cell chromosome--that occurs only in virulent strains of Yersinia enterocolitica bacteria. The test will help microbiologists study this pathogen and improve food safety for consumers. Microbial Food Safety Research, Eastern Regional Research Center, Philadelphia, PA

Saumya Bhaduri, (215) 233-6521

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The Briefs is published quarterly in January, April, July and October. For further information or addition to the mailing list, contact Judy McBride, ARS Nutrition Editor, at (301) 344-4095; or write to me at ARS Information, Bldg. 005, BARC-West, Beltsville, MD 20705.